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TWO-DIMENSIONAL COUPLED RESONATOR OPTICAL WAVEGUIDE ARRANGEMENTS AND SYSTEMS, DEVICES, AND METHODS THEREOF

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Abstract

The ability to significantly slow down (delay) the propagation of light has remarkable applications for optical communication and quantum information processing. Photonic devices with this slow down property are called delay lines. Currently, Couple Resonator Optical Waveguides (CROWs) provide and approach for micro-fabricated, on-chip ; delay lines but their performance is hindered by fabrication errors such as resonance mismatch. We propose a novel two-dimensional array of CROWs, which can overcome those problems. In particular, by coupling input/output waveguides to the edge of the system, a robust delay-line can be achieved. The bandwidth-delay product of such a system is similar to 1D CROW. However, in contrast to 1D CROW, where the transport properties is deteriorated by the presence of impurities such as frequency mismatch betweeen resonators, the new system is robust to impurities and the operational bandwidth and delay time are preserved. The underlying physics is base on the presence of robust quantum edge states in a two-dimensional system with a pseduo-magnetic, in direct analogy to electronic quantum Hall physics.

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References

- Serial No. 13/366,122, Filed on 2/3/2012, Published on 12/6/2012

Status of Availability

This invention is available for licensing exclusively or non-exclusively in any field of use.

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